The methods by which I succeeded in rendering the young *Synaptæ* accessible to observation, the details of the developmental processes, so far as they have not already been observed by J. Müller, and the anatomical characters of *Synapta digitata* (visible with remarkable facility in the little transparent creatures, which are perfect from mouth to anus) shall be described in detail. At the same time reasons will be given why the unveiling the vital history of the molluskigerous sac is rendered probable by the discovery of these young *Synaptæ*. The difficulties which set bounds to the further prosecution of this course lie in the fact that it was not possible to capture *Synapta digitata* in the young state described in the same quantity as the full-grown animals, which is the first condition for the observation of the molluskigerous sac, on account of its great rarity.

Together with *Synapta digitata*, the somewhat smaller *Synapta inhærens* (probably *S. Duvernæa*, Quatref.), distinguished by its more strongly adhesive skin and plumosely branched tentacles, occurs in smaller numbers near Trieste, in the Bay of Muggia. I had the opportunity of observing the brood of this species also, mixed with that of *S. digitata*, up to the point at which it likewise had the anchors in its skin and acquired the full number and specific form of its tentacles. The young Holothurids of this species are only distinguished by having no calcareous wheels or globules in the posterior extremity, but, instead of them, a group of irregularly angular calcareous pieces. From the *Auricularia* of *Synapta digitata* that of *S. inhærens* probably does not differ at all, except in this condition of the calcareous structure. The latter would, therefore, not be recognized at the time when only larvæ, without any young Holothurids, occurred.

XXIII.—*On the Discovery of Ancient Remains of* Emys lutaria *in Norfolk.* By Alfred Newton, M.A., F.L.S.

[Plates VI. & VII.]

On the 31st of March last, in the course of a communication to the Philosophical Society of the University of Cambridge, I had the pleasure to announce a fact in British archæontology, which, as far as I am aware, is hitherto unrecorded; and as that paper will not be published in a form likely to bring it under the especial notice of naturalists, I propose to give a short account here of what I venture to think may be regarded as a discovery not altogether unimportant.

In the early part of this year, while examining a considerable collection of ancient remains in the possession of Mr. Birch, of

Wretham Hall, near Thetford, I recognized, to my surprise, some specimens far more interesting than any I had hoped to meet with; and these, by that gentleman's kindness, I was enabled to exhibit at the meeting of the Society above named. They consist of a few bones of the limbs and a good part of the outer skeleton of two individuals of the European freshwater Tortoise *Emys lutaria* of Merrem (*Testudo europæa* of Bojanus, *Cistudo europæa* of Duméril and Bibron), a species whose existence at any time in the British Islands had never before been suspected*. They were found, as testified by a label attached to them in Mr. Birch's handwriting, so long ago as June 1836, in a peat-bog by the side of a spring-pit at East Wretham, about 7 feet below the surface and beneath some fifteen hundred laminations of a species of *Hypnum*, which, I understand from Mr. Birch, was pronounced by Sir William Hooker to be *H. filicinum*†.

I communicated these facts forthwith to Professor Owen and Professor Bell, as being respectively the highest authorities on fossil and recent British reptiles, and subsequently submitted the remains to the first-named gentleman, who kindly determined the species for me, thereby confirming the view I had taken of it. In these days the geographical range of this little Tortoise is somewhat remarkable. I am not aware of any indications of its existence in Holland, Belgium, or Northern France. In the North-west of Germany it is unknown; but it occurs in Baden, Würtemberg‡, Bavaria, Austria, Hungary, Poland, and Silesia, whence it seems to extend in a north-western direction through Eastern Prussia, as far as Rostock. At the present time, it is not recognized as an inhabitant of either Denmark or Sweden; but its remains have been found in both countries under circumstances similar to those of the Norfolk ones I have just recorded, as may be seen from the following abstract of the statements of Professors Dalman, Nilsson, and Steenstrup.

In the Transactions of the Stockholm Academy (K. Vetensk. Acad. Handl. 1820, pp. 286–293, tabb. vi. and vii.) Professor Dalman gives an account of some Tortoise-bones found in digging the Götha canal, near Norsholm, in the province of Œstergöthland. They seem to have been about 15 feet below the surface, in peat-earth, over which a layer of gravel had been

* I believe that as yet no trace of any of the *Testudinata* has been obtained in England from a formation later than that of the London Clay—certainly not from any post-Tertiary deposit.

† Sir Charles Bunbury has been good enough to refer me to a communication of his in the Quarterly Journal of the Geological Society of London for 1856 (vol. xii. p. 355), in which he describes a similar layer of moss found at West Wretham, and there identifies the species as *H. fluitans*.

‡ See G. v. Jäger, in Bull. Soc. Nat. Mosc. 1861, xxxiv. p. 190.

superimposed, and to have been the remains of two individuals, which the writer declares to have belonged to *Emys europæa* of Oken, as distinguished from *E. lutaria*, though, I believe, the best authorities now consider these two supposed species to be identical. He also adds, in a note, that a third and entire skeleton, dug up a long time before in making a deep ditch near Regnaholm, in the same province, had been brought to his notice by Major Gyllenkrook since his communication to the Academy. In a later volume of the same Transactions (1839, pp. 194–211, tabb. iii. & iv.) Professor Nilsson notices a similar discovery made at two places in Skåne, one specimen having been found in 1839 near Gräfve, in the pastorate of Brågarp, at a depth of 8 feet, in peat, and another disinterred the following year, near Fuglie, in the pastorate of Hvällinge. He gives a minute description of the former example, detailing some points of difference observable between it and recent specimens of *Emys lutaria*, Bp., which differences he there considers sufficient to warrant his designating the fossil as *E. lutaria*, "var. *borealis*." In 1842, this veteran naturalist, in his 'Skandinavisk Herpetologi' (p. 11, *note*), mentions that, more than twenty years previously, he had received from a student a living example of *E. lutaria*, captured in the district of Falsterbo, the extreme south point of Sweden, which, at the time, he thought could only have been an imported animal, accidentally escaped, and so neglected to make further inquiries respecting it. He likewise states (p. 10, *note*) that, shortly before the publication of his work, he had obtained, from Medic. Candid. Fornander, fragments of a fossil Tortoise found in a moss in Œland. This he identifies with the existing *Emys lutaria*, and appears content to let his own "*borealis*" sink into obscurity, as if doubtful of its validity even as a variety.

Fourteen years ago, Professor Steenstrup announced to the Copenhagen Scientific Association (Overs. over det Vidensk. Selsk. Forhandl. 1848, p. 74) the discovery of the dorsal portion of the skeleton of a Water-Tortoise in a turf-moss at Overdraaby, near Jægerspris, in Zealand (Sjælland), and, in doing so, referred to Professor Nilsson's statements just quoted. Some years later, he communicated to the same Association (1855, p. 1) the fact that the sternum and vertebræ of another individual had been found in a similar formation at Egholm, not far from the locality last mentioned; and soon after, the same illustrious zoologist gave an account (1855, p. 384) of the remains of a third, but smaller and younger, example, which had since been obtained at that spot.

I regret that it is beyond my power to furnish a full and detailed description of the specimens whose discovery I now record.

I can only make a few observations upon them; and these, I may add, have been chiefly brought to my notice by my kind friend Dr. Albert Günther.

Of the limbal remains of the two individuals*, I have now before me sixteen bones or fragments of bones, consisting, when fitted together, of *one* right humerus, *one* right and *one* left scapula, *one* right and part of *one* left clavicle, *two* right and *two* left femora, *one* entire pelvis, with *two* portions of another, and *one* right and *two* left tibiæ. From these bones it is plain that the two individuals differed slightly in size.

Of the vertebral remains in the larger specimen, *thirty-six* out of the sixty-three bones, or more than half, remain. To specify them, I shall adopt the system of notation employed by Bojanus in his beautiful Monograph of this species†. The median or vertebral row of the dorsal bones is the most deficient, only *three* out of the ten, namely, v, IX, and X, being left. It is very unfortunate that the sixth, seventh, and eighth are lost, as they appear to vary much in different individuals, and I cannot conjecture what shape they may have had here. Of the twenty-four marginal bones, *nine* are forthcoming; these luckily include XI and XXIII, the nuchal and caudal scutes. The others which have been preserved are XV, XVI, XVII, XVIII, XXVIII, XXIX, and part of XXXIV. The costal bones on the right side all remain, with the exception of the first false rib, XXXV; on the left side, four of the ten are missing, namely, XLV. XLVI, XLVII, and LI. The processes of the tenth false rib on either side, XLIV and LIV, remain attached to XLIII and LIII respectively. The sternal bones of this (the larger) specimen are in a singularly perfect state, the posterior process of the left hinge alone being somewhat damaged. Thus it will be seen that the portions present are such that the size of the specimen can be pretty correctly ascertained; and accordingly I give the following dimensions, which, I am confident, approach the truth very nearly:—

Entire length of carapace, in a straight line,	7 inches.
Ditto, following the curve	8·2 „
Entire breadth of carapace, in a straight line,	5·5 „
Ditto, following the curve	8·6 „
Greatest length of plastron	7·5 „
Greatest breadth of ditto	4·4 „

* I ought to say that I was not aware that the bones were those of *two* individuals, until the fact was mentioned to me by Prof. Owen, though, in justice to myself, I may add that I despatched them to him immediately on their being entrusted to my care.

† 'Anatome Testudinis Europææ,' &c. fol. Vilnæ et Lipsiæ, 1819–21.

In the smaller specimen, *nine* dorsal bones only remain : these I believe to be XIV, XXVII, XXVIII, XXX, XXXVII, XXXVIII, XLIX, LI, and LII ; but I am not very certain that my identification of them is correct. Of the sternum, more than one-half has been preserved, the missing bones being LV, LVI, LVII, part of LVIII, and LIX ; but the cardinal processes are much less perfect than in the larger example. The greatest breadth of the sternum is 4·25 inches ; the length from the transverse articular suture to the posterior extremity is 4 inches, while in the larger example it is 4·25 inches.

For the rest I must refer the student to the plates (Pls. VI. & VII.) accompanying this brief and incomplete notice, which will give a far better idea of the relics of these ancient Britons than anything I can say about them.

Elveden, June 30, 1862.

PROCEEDINGS OF LEARNED SOCIETIES.

ZOOLOGICAL SOCIETY.

February 11, 1862.—Dr. J. E. Gray, V.P., in the Chair.

Contribution to the Knowledge of the British Charrs. By Dr. Albert Günther.

The production of the following paper has been induced by two specimens of the so-called Freshwater Herring of Lough Melvin in Ireland, which were procured by Joshua Walker, Esq., and submitted to my examination. The differences from the allied Continental species were so striking, that, from the first moment, I could scarcely doubt that I had a species before me which I had never seen before. In the first place it appeared necessary to compare it with specimens from other localities of Great Britain—with the true British Charr ; but, although the period of the year (November and December) appeared to be the most favourable for the capture of those fishes, as they approach the shores to spawn, afterwards returning to the deepest parts of the lakes, I have been only partly successful in obtaining more specimens, and I particularly regret not having been able to examine specimens from Scotland, either in a fresh state or preserved in spirits*. I have obtained, however, materials sufficient for the determination of the Charrs of three localities, by the kind assistance of the gentlemen who will be mentioned hereafter. Our knowledge of the representatives of the Charr on the Continent is chiefly due to Heckel, Nilsson, and Rapp, in whose descriptions due attention has been paid to those characters by which the species may be distinguished ; and for a comparison of the British Charrs with those of the Continent I have had to rely chiefly on them. My materials were the following :—

* Dried and stuffed specimens of Charr are of little or no use.